of gases, one of the greatest modern physicists informs us, is "lost in antiquity." The atomic theory of matter is accurately stated in the "De rerum natura" of Lucretius, who got it from its Greek author Democritus; and Lord Kelvin, in his ingenious essay "Æpinus atomized," has indicated that the essential features of the electronic theory of matter had already been stated over a hundred years before, by the Rostock physicist Franz Hoch (1759). Who can doubt that the Greek scientists owed much to the learned Orientals and Egyptians who preceded them? We may take comfort then in the shrewd observation of the author of "Hudibras" that the speculative theorist is often several generations behindhand:

"For Anaxagoras long agone,
Saw hills, as well as you, in the moon;
And held the sun was but a piece
Of red hot iron, as big as Greece;
Believ'd the heavens were made of stone,
Because the sun had voided one;
And, rather than he would recant
The opinion, suffered banishment."

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A COMMENT ON ASPHYXIA

SOME surprising material is contained in Dr. John Auer's reply[1] to a note on the "Effect of Asphyxia on the Pupil," by A. H. Ryan, F. V. Guthrie and myself.[2] As he does not present any evidence against, nor even deny the accuracy of our observations on, the phenomenon to which we recalled attention by the statement that as a rule a very marked constriction of the pupils occurs in an early stage of asphyxia, no reply is necessary.

But since he attempts to account for our statement by saying that had we pushed our experiments further we "would have found the marked dilatation of the pupil which occurs in mammals during the second and third stages of asphyxia," as the senior author of the note I feel it incumbent upon me to make certain statements in order that those not thoroughly conversant with the subject may not receive erroneous impressions regarding the phenomena of asphyxia on the pupil.

It would seem that the classical phenomena of asphyxia are too well known to require mention, but in view of the above, I will here give an elementary statement of them taken from Starling,[3] to whom we referred in our communication:

The phenomena of asphyxia may be divided into three stages:

1. In the first stage, that of hyperpnœa, the respiratory movements are increased in amplitude and in rhythm. This increase affects at first both inspiratory and expiratory muscles. Gradually the force of the expiratory movements become increased out of all proportion to the inspiratory, and the first stage merges into:

2. The second, which consists of expiratory convulsions, in which almost every muscle of the body may be involved. Just at the end of the first stage consciousness is lost, and almost immediately after the loss of consciousness we may observe a number of phenomena extending to almost all the functions of the body, some of which have been already studied. Thus at this time the vasomotor center is excited, causing universal vascular constriction. There is often also secretion of saliva, inhibition or increase of intestinal movements, *constriction of the pupil*,[4] and so on.

3. At the end of the second minute after the stoppage of the aeration of the blood, the expiratory convulsions cease almost suddenly, and give way to slow deep inspirations. With each inspiratory spasm the animal stretches itself out, and opens its mouth widely as if gasping for breath. The whole stage is one of exhaustion; *the pupils dilate widely*,[4] and all reflexes are abolished. The pauses between the inspirations become longer and longer, until at the end of four or five minutes the animal takes its last breath.

Therefore, the implication that we were not aware that dilatation of the pupil occurs in a later stage of asphyxia is unworthy of further mention. Nor need any attention be paid to the term "original communication" applied to our note, for by this fact alone he shows that he had not read it even with

[1] SCIENCE, N. S., 1910, XXXI., 578.
[2] SCIENCE, N. S., 1910, XXXI., 395–396.
[3] "Elements of Human Physiology," 1907, 8th edition, pp. 404–405.
[4] Italics mine.

casual care. For therein we specifically stated that notwithstanding the fact that we could find no comprehensive treatise on this phenomenon in the sources at our command, still we had the impression that very thorough observations have long since been made and recorded, but felt justified in recording our observations in order to *recall* attention to the phenomenon. So, notwithstanding Dr. Auer's conviction to the contrary, I still hold that the material contained in our communication is not original.

Finally, had Dr. Auer made careful observations upon the frog's pupil he would have found that excision of the eye or stoppage of the frog's circulation, as by removing or tying off the heart, are alone followed by very marked asphyxial constriction of the pupil, and therefore the employment of additional asphyxial procedures is entirely superfluous. His conclusion might then well have been *that asphyxial changes in a frog's pupil differ from those in mammals in that there is not such a well-marked period of asphyxial pupillary dilatation.* It should be observed that we pointed out in our note that the post-mortem condition of the pupil in different mammals varies: in cats it is chiefly dilatation; in common gray rabbits constriction (as compared with the size of the normal pupil in diffuse daylight). From this it is obvious that the asphyxial changes in the frog's pupil as compared with those of the rabbit are in general similar, the chief difference being a well-marked but short period of dilatation in the rabbit.

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QUOTATIONS

"Medical Freedom"

Makers of patent medicines, adulterators of drugs, and practitioners of the cults of mental and osteopathic healing are up in arms. They have persuaded a few well-intentioned but misled individuals to join them, and have formed the "National League for Medical Freedom" to oppose the efforts of practically all the reputable physicians in the country to consolidate the agencies of public health at Washington into one efficient department or bureau.

These efforts have been waxing stronger. The men of the American Medical Association and of the Committee of One Hundred on National Health, sanctioned by the Association for the Advancement of Science and headed by Professor Irving Fisher, of Yale, have won the approval of the entire press of the United States in urging the passage of their bill. In the various departments and bureaus of the federal government are lodged powers that can not be wielded effectively until they shall be coordinated under one head. Once united, they can be used in a great propaganda for educating the people against the habit of self-dosage and a resort to quack medicines for their ailments. By a campaign of prevention the bureau would break the prevalence of epidemics and infections between the states. It would work for the passage of laws that would guard the channels of inter-state commerce against the admission of adulterated drugs, and for the establishment of standards of purity and strength that would be copied by the states and cities of the nation.

The self-styled "League for Medical Freedom" quotes Professor Fisher accusingly as having said that the government might soon be appropriating millions yearly for the conduct of this bureau. If it should appropriate a million for every hundred thousand it now appropriates for the protection of the health of hogs and cattle in the United States, Professor Fisher's prophecy would be fulfilled, and no one would have cause for complaint but these friends of "freedom." Their cry is an old one and well understood.

License they mean, when liberty they cry.—The N. Y. *Times.*

SCIENTIFIC BOOKS

Ants. Their Structure, Development and Behavior. By William Morton Wheeler. New York, Columbia University Press, Macmillan Co., publishers. 1910.